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SEASONING MANZANITA WOOD

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Manzanita, of which there are many different species native to California, produces a hard wood which has a beautiful color and sometimes a pleasing figure. The wood is of fine texture and takes a beautiful polish. On account of the excessively crooked growth of manzanita, its wood cannot be used for lumber; but it would make a very excellent wood for smaller novelties and ornamental products, were it not for excessive damage from splitting, checking and warping, to which it is subject in drying. This damage can only be avoided by exercising the greatest care, and the problem is still not sufficiently solved to permit stating hard and fast rules.

For a commercial manufacturing operation large enough to have a dry kiln, careful and intelligent kiln drying is better than air seasoning. Most inquiries in regard to the seasoning of manzanita which are received by this Station, however, come from persons who do not have dry kilns available. This discussion will therefore be limited mainly to air drying, and other methods usable with little equipment expense.

Drying troubles are likely to be worse with wood in a log or round form than when the material is sawed up into smaller pieces. It is best, therefore, to saw round logs or bolts, as quickly as possible after they are cut, into suitable blanks or the rough forms of most convenient dimensions for working up into the final product desired.

Since end-splitting and checking are due to the much more rapid drying of wood from end-grain surfaces than from the sides, the next thing, with a refractory wood like manzanita, should be to paint the ends of the sticks with something which will reduce this excessive end drying. Ordinary paint helps a little, but is not nearly effective enough to reduce the rate of end drying to a near equality with that from the sides. Painting the ends with hot paraffine, or dipping them in it, is much more effective. Other hot coatings which are also better than ordinary paint are coal tar pitch, asphalt, or a mixture of 7 parts of lamp black in 100 parts of melted rosin. These coatings have to be applied hot because they are solid at ordinary temperatures.

One of the best coatings, and also one which can be applied cold, is bakelite varnish mixed with aluminum paste (paste form preferable but aluminum powder will answer if paste is not available) stirred thoroughly into the varnish in the proportion of 3 pounds of aluminum to 1 gallon of varnish. Two coats of this preparation should be painted onto the ends of the sticks. This mixture is relatively expensive, but for small amounts of wood the extra expense is not great enough to outweigh the superior convenience and effectiveness of the preparation. For large amounts of wood, as in a commercial operation, a cheaper preparation which is more effective than most others is a filled, hardened gloss oil, made in accordance with the following formula of the U. S. Forest Products Laboratory:

rosin	100 parts by weight
quick lime	8 " " "
mineral spirits	57.5 " " "

To 100 parts of this gloss oil add:

barites	25 parts by weight
asbestine (or fibrous talc)	25 " " "

It is difficult to obtain the best results by home mixing of the gloss oil part of this preparation. By specifying this formula the gloss oil can be obtained ready mixed from paint manufacturers. But do not let them sell you any other prepared gloss oil. Every paint maker or seller carries a hardened gloss oil, which he will of course think is as good as anybody else's. For this purpose, however, no other known formula is as good as that given above. In the complete preparation, the heavy barites and asbestine tend, in time, to settle out of mixture with the gloss oil. It is better, therefore, for the user to obtain the barites and asbestine separately and mix them with the gloss oil (with thorough stirring) in quantities as needed for short periods. If the mixture is needed only for immediate or short time use, it may be more convenient to have it completely mixed by a paint dealer. This preparation can be applied cold.

With refractory woods such as manzanita, it is helpful to slow down the rate of drying so that the rate of moisture transfusion within the wood can keep up with the drying from the surface. One of the advantages of kiln drying is that by keeping the humidity high it can slow down the surface drying, while speeding up the transfusion by maintaining a higher temperature than in air drying. Thus it can equalize the two at a faster rate than is possible in air drying. In the absence of a dry kiln the most usual method of slowing down the drying is to keep the wood in a cool and not too dry place, as in a basement or cellar. If additional slowing down of the drying rate proves to be necessary to prevent damage to the wood, cover the sides of the stick with a drying retardant, as well as the ends. If this is hot enough, try burying the stick, thus treated, at least two inches deep in moist sawdust.

When more than one or a very few pieces of wood are to be air seasoned, the method of piling the pieces for the air seasoning becomes a means of influencing the rate and character of the drying. The pile should rest on cross sticks or stringers supported so as to give unobstructed air circulation space beneath the pile. The movement of air in the pile is mainly downward, as it picks up moisture from the wood, and becomes heavier because of the cooling due to evaporation. This moisture-laden air must therefore be able to escape freely at the bottom, or the drying will be unnecessarily impeded.

It is desirable, in any air seasoning, to pile in any one pile only boards or pieces of the same length, so that the end supports can come at the exact ends of all boards, without hang-overs which are a fertile source of warping and other troubles. These instructions are intended for hardwood species, which are mostly the ones that are refractory in drying, and they assume lengths and quantities of material not so great as to prevent drying indoors, or at least in a covered shed. If such sticks are more than 2 to 3 feet long they should also be supported by narrow cross pieces, so as to give support against sagging, at intervals of 2 to 3 feet between the end supports. The boards or pieces to be seasoned should be evenly laid, with regular spacing between successive pieces. The successive layers of stock should be separated by narrow crossers, laid exactly above each end support and the intermediate supporting strips at the bottom. Both the width of the spaces between sticks and the thickness of the crossers depend on how rapidly the wood that is being seasoned can dry without developing warping, surface checking, and other seasoning defects.

Where a deliberate attempt is being made to hold down the rate of drying, as in the case here discussed, the spacing between the boards or pieces being seasoned, as well as the thickness of the crossers, will have to be kept small, maybe 1/2 inch or even less. This should be determined by the condition and behavior of the stock being seasoned, which should be carefully watched. Drying under such conditions will take a long time, six months to a year, or even more.

There are two other processes which may have value for seasoning manzanita. The writer once saw a manzanita cane which was perfectly straight and without any drying defect, and was one of the most beautiful things he had ever seen, having a depth of luster in the finish that made it look like mother-of-pearl. This cane was said to have been made by sawing the wood into blanks as soon as it was cut, and then immersing the blanks in sweet oil for two years. Ordinary cottonseed salad oil or any other such edible vegetable oil should answer. There are difficulties, on theoretical grounds, in seeing how this oil seasoning could work satisfactorily; but there was the cane, and that was the way it was said to have been seasoned. Two years in oil, however, would be altogether too slow a process for most purposes. There has been no recorded experimental work to show whether this time could be cut down.

Recently there has come into prominence a new method called chemical seasoning. The most usual form employs common salt. Rock salt is the better form, because of the frequence with which starch or other materials are added to table salt. In this method the wood is immersed in a brine of the salt for 4 to 8 days, depending on the needs of the particular wood. Try it first with a saturated brine, i.e., as much salt as the water will dissolve, and use the maximum time. If results are satisfactory, you can then try cutting down the time and the salt concentration. The wood is then taken out of the brine and allowed to season in the air. The time required for this air seasoning is somewhat greater for wood thus brine soaked than it is for wood not so treated, because of the added water which must be taken out again; but is very much less than it is under any of the expedients for reducing damage by slowing down the rate of drying, mentioned in the preceding parts of this note. The great advantage of the method is in its remarkable prevention of checking, splitting, and other defects produced by ordinary air exposure of refractory woods, without the salt treatment. It should be noted that salt brine will attack an iron container; a wooden vat or tank is better for this purpose.

This method has not been completely worked out yet, and it has not been tried on manzanita, so far as is known. It is suggested as worth trial, however, with intelligent care in adjusting the immersion time and the strength of the brine to the needs of the wood if first experiments do not produce the best results. Common salt is not suitable for certain purposes, such as drying manzanita burl for smoking pipes, or on woods whose electrical properties must be maintained. In the latter case a solution of invert sugar is used by the Forest Products Laboratory.

Since wood which has been given the salt brine treatment should be able to be air seasoned in nearly the normal manner, that means that the rails or stringers supporting the pile should be high enough from the ground or floor to leave at least a foot, better 18 inches of unobstructed air circulation space beneath the pile; also the spacing between the boards or pieces being seasoned should be increased, say to 2 inches at the bottom, narrowing gradually to 1 inch at the top, and the thickness of the crossers should be increased to about 1 inch, to accommodate the greater flow of air necessary for faster seasoning. Watch the progress of the seasoning and be guided accordingly. If end-checking appears, it probably means that a moisture retardant coating should be applied. What woods an end coating is needed for in connection with salt seasoning and, if so needed, whether it should be applied before the salt bath or after, has not yet been well worked out. Some species have seemed to work better one way, some the other. The Bakelite varnish-aluminum paste coating seems to withstand the salt bath better than any other. It is clear, however, that salt seasoning is so much faster than any other methods which approach its effectiveness in preventing seasoning damage that it will be most advantageous for any wood to which it can be successfully applied.

NOTE: To obtain the maximum seasoning which local climatic conditions permit, without unnecessarily long holding of stock, one must have some more accurate measure of the progress of seasoning than just a guess that "that ought to be enough." With a refractory wood, like manzanita, if the seasoning is not carried about as far as your climatic conditions permit, checking or warping may develop after the supposedly seasoned wood is worked up into some valued product, due to further drying when the wood is without the special protection which was given in the seasoning. About the simplest method is to select one to three (according to the amount of stock to be seasoned) pieces of the stock, to be used as samples to be pulled out of the pile for periodic examination. For a small amount of stock one sample is enough. If, however, the amount of stock is sufficient to make a large, heavy pile, three samples will be desirable and they must be enough thinner than the others so that they can be pulled from the pile easily and without disturbance of the pile. The samples should have applied to them whatever coating is to be used for the seasoning. Then they should be numbered and weighed, and can then be put in the pile, having in a large pile one sample near the bottom, one near the middle and one near the top of the pile. By taking these samples out and reweighing them at intervals of one month, close track can be kept, not only of the general progress of seasoning but, in the larger piles, of the progress in different parts of the pile. If the bottom of the pile shows undue lag in seasoning, for example, valuable material may warrant repiling and opening up the spacing in that part of the pile. The seasoning should continue until the loss in weight per month becomes zero or negligible.

More accurate knowledge of drying progress, in terms of percentage moisture content on the basis of the dry weight of the wood, often permits more accurate adjustment of drying conditions to the needs of the wood. To anyone interested in such more accurate control, this Station will send on request instructions for such procedures.